The opinion in support of the decision being entered today was <u>not</u> written for publication and is <u>not</u> binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

<u>Ex parte</u> WILLIAM J. BENMAN
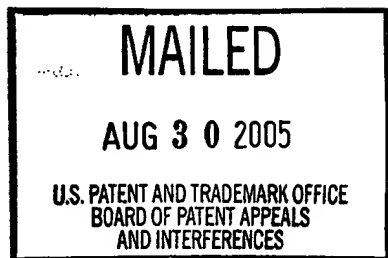
Appeal No. 2005-2148
Application No. 09/363,456[1]

ON BRIEF

Before HAIRSTON, SAADAT and NAPPI, <u>Administrative Patent Judges</u>.

SAADAT, <u>Administrative Patent Judge</u>.

<u>DECISION ON APPEAL</u>

This is a decision on appeal from the Examiner's final rejection of claims 1, 3-12 and 14-20. Claims 2 and 13 have been canceled.

We affirm.

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[1] Application for patent filed July 29, 1999, is a continuation-in-part of Application No. 08/754,729, filed March 26, 1997, now U.S. Patent No. 5,966,130, which is a continuation-in-part of Application No. 08/241,732, filed May 12, 1994, now U.S. Patent No. 5,784,546.

BACKGROUND

Appellant's invention is directed to optical systems and methods for extracting a foreground image from a frame that includes both a foreground and a background image without the use of monochromic screens or filters. An understanding of the invention can be derived from a reading of exemplary independent claims 1 and 7, which are reproduced as follows:

1. A system for extracting an image comprising:

first means for providing image data;

second means responsive to said first means for storing a first frame of image data consisting of a heterogeneous background scene;

third means responsive to said first means for providing a second frame of image data consisting of a second scene having said background scene at least partially obscured by a foreground object; and

fourth means responsive to said second and third means for processing said second frame to extract an image of said object independent of said background scene, said fourth means including:

means for comparing picture elements of said second frame to corresponding picture elements in said first frame; and

means for outputting said corresponding picture elements in said second frame if the result of the comparison is a predetermined value.

7.   A system for extracting images comprising:

first means for providing image data;

second means responsive to said first means for storing a
first frame of image data consisting of a heterogeneous
background scene;

third means responsive to said first means for providing a
second frame of image data consisting of a second scene
having said background scene at least partially obscured by
a foreground object;

fourth means for subtracting said first frame from said
second frame and providing a difference frame;

fifth means for processing said difference frame to provide
a template, said fifth means including means for
differentiating said filtered image to provide said
template; and

sixth means for multiplying said second frame by said
template to "entract" an image consisting essentially of
said foreground object.

The Examiner relies on the following references in rejecting

the claims:

Astle et al. (Astle)	4,827,344	May 2, 1989
Adelson	5,706,417	Jan. 6, 1998 (filed May 27, 1992)
Parulski et al. (Parulski)	6,366,316	Apr. 2, 2002 (filed Aug. 30, 1996)

Claims 1, 3-12 and 14-20 stand rejected under 35 U.S.C.

§ 103(a) as being unpatentable over Parulski and Adelson.

Claims 19 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Parulski, Adelson and Astle.[2]

Rather than reiterate the opposing arguments, reference is made to the briefs and answer for the respective positions of Appellant and the Examiner. Only those arguments actually made by Appellant have been considered in this decision. Arguments which Appellant could have made but chose not to make in the brief have not been considered (37 CFR § 41.67(c)(1)(vii)).

OPINION

In rejecting claims under 35 U.S.C. § 103, the Examiner bears the initial burden of presenting a prima facie case of obviousness. See In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). To reach a conclusion of obviousness under § 103, the examiner must produce a factual basis supported by teaching in a prior art reference or shown to be common knowledge of unquestionable demonstration. Such evidence is required in order to establish a prima facie case. In re Piasecki, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88

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[2] The issue of whether claims 1, 3-12 and 14-17 are in conflict with claims 1-17 of Application No. 09/363,771 under 37 CFR § 1.78(b) is moot and no longer before us as the conflicting application has been abandoned.

(Fed. Cir. 1984). The Examiner must not only identify the elements in the prior art, but also show "some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead the individual to combine the relevant teachings of the references." In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988).

Appellant argues that, instead of pixel-by-pixel comparison or differentiation, Parulski generates a composite image using the difference between two images (brief, page 4-8; reply brief, page 2). Appellant further asserts that a differencing operation is different from a comparison operation and provides a truth table that shows the results of subtracting the binary values of two pixels (brief, page 7). In response, the Examiner asserts that the foreground mask Parulski generates at step 24 of Figure 1 is the result of comparing the picture elements in the first and the second frames (answer, page 6). The Examiner adds that Parulski further processes the foreground mask using a look-up table (LUT) to extract the image from the frame with the background and combine it with another background (answer, page 7).

After a review of Parulski, we agree with the Examiner that generating the foreground mask by using the difference between

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the two images and processing by the use of the LUT reasonably

reads on the means for "comparing." In construing a

means-plus-function limitation, we must identify both the claimed

function and the corresponding structure in the written

description for performing that function. Here, the only

disclosed structure for performing the step of comparing is

comparator 40 (specification, the paragraph bridging pages 6 and

7) which is depicted in Figure 2 as a box. There are no specific

structural or functional details in the disclosure that one can

rely on for attributing the functions described by Appellant

(brief, pages 7 and 8) to the claimed "means for comparing".

Turning to the truth tables included in Appellant's brief,

we observe that they are not parts of the disclosure that may be

relied on for determining the corresponding structures for

performing the claimed functions. In particular, we remain

unconvinced by Appellant's attempt to overly limit the function

of "comparing" to those shown in a truth table since a

"comparator," in a broad sense, determines the relationship among

the inputs based on their similarities and differences and

disclosed alternate embodiments refer to using a "subtractor" for

comparing the images. Therefore, Parulski's use of a subtractor

to determine the difference between the first and the second

images which are later converted to binary values (col. 4, lines

22-26) constitute the means for comparing images that extracts an

image of said object independent of its background.

Appellant further argues that the claimed pixel-by-pixel

comparison is not taught in the references (brief, page 8).

Appellant asserts that the mere use of a subtractor for

processing equivalent images is not the same as the "means for

effecting [sic.] pixel-by-pixel comparison" (reply brief, page

2). The examiner responds by pointing out that Parulski

generates the foreground mask at step 24 by comparing picture

elements of the second frame to the corresponding picture

elements in the first frame (answer, page 6).

A review of Parulski confirms that the reference relates to

digital imaging systems (abstract; col. 1, lines 18-21) which in

turn, indicates that the image processing is performed on a pixel

level. Specifically, Parulski provides for correcting pixels in

the foreground mask image which have zero difference values when

the background and the foreground images have the same value in

those pixels (col. 3, lines 45-51). Therefore, as pointed out by

the Examiner, the claimed comparison of the picture elements

reads on the pixel-by-pixel processing of the images to extract
the subject image from the background image and generate the
foreground mask.

Turning now to the teachings of Adelson, we note Appellant's
assertion that Adelson teaches pixel-by-pixel operation for
encoding or decoding, but not pixel-by-pixel comparison of two
image frames (brief, page 10). Although Adelson mentions
decoding and encoding of images, the process is based on
combining the background image with a foreground image that is
moving with respect to the background (col. 5, line 65 through
col. 6, line 4). Thus, as stated by the Examiner (answer, page
4), the zero and unity points on an attenuation map do correspond
to positions of the edge points in the foreground image or their
absence when compared to the background image (col. 6, lines 8-
14). /

In view of our analysis above, we find that the Examiner has
reasonably set forth a prima facie case of obviousness because
the necessary teachings and suggestions related to the claimed
means for comparing picture elements of two image frames to
extract an image of an object independent of its background are

shown. Accordingly, we sustain the 35 U.S.C. § 103 rejection of independent claim 1, as well as claim 17 grouped therewith (brief, page 10) and claims 3-6 and 18-20 dependent thereon.

With respect to claim 7, Appellant argues that the terms "differentiating" and "differencing," as used in the claim and disclosed in Parulski respectively, are not the same (brief, page 12). In response, the Examiner points out that the difference frame outputted from subtractor 70 in Parulski is the same as the claimed difference frame whereas the claimed means for differentiating reads on the LUT and the filter in Parulski which is applied to the difference image for generating the foreground mask image (answer, page 8).

Upon reviewing Appellant's disclosure, we find that no specific structure for performing the function of "differentiating" is defined. Therefore, as broadly as claimed, the claimed "means for differentiating" reads on Parulski's means for generating the foreground mask or template, such as the LUT applied to the difference image. Parulski further teaches that the mask is used to extract a foreground image which, in a compositing step 26, is combined with a new background to generate a new composite image (col. 2, lines 44-51). As

we find the Examiner's position to be reasonable and Appellant has not further challenged the Examiner's position, we sustain the 35 U.S.C. § 103 rejection of independent claim 7, as well as claims 8-16 dependent thereon.

Turning finally to the rejection of claims 19 and 20 over Parulski, Adelson and Astle, we observe that Appellant merely argues the failure of Astle in providing the teachings that were allegedly absent in Parulski and Adelson (brief, pages 12 & 13). As discussed above, Parulski and Adelson provide the necessary teachings to support a prima facie case of obviousness and therefore, the 35 U.S.C. § 103 rejection of claims 19 and 20 over Parulski, Adelson and Astle is sustained.

CONCLUSION

In view of the foregoing, the decision of the Examiner

rejecting claims 1, 3-12 and 14-20 under 35 U.S.C. § 103 is

affirmed.

No time period for taking any subsequent action in

connection with this appeal may be extended under 37 CFR

§ 1.136(a)(1)(iv).

AFFIRMED

KENNETH W. HAIRSTON)
Administrative Patent Judge)
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Administrative Patent Judge)   APPEALS
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